Professional Development: Catalyst for Change?

Difficulty securing adequate professional development (PD) has long been a barrier to the effective implementation of educational technology. The authors of the first Office of Technology Assessment report on technology in the schools in 1988 applauded a marked increase in the number of computers that had been installed in school buildings but were disappointed with the limited amount of funding that had been spent to train teachers. When the 1995 report came out, concerns about the impact of limited teacher training had become serious. "Most teachers have not had adequate training to prepare them to use technology effectively in teaching," the report stated. "Currently, most funds for technology are spent on hardware and software, but experienced technology-using sites advocate larger allocations for training and support. On average, districts devote no more than 15% of technology budgets to teacher training." The report concluded that "a majority of teachers report feeling inadequately trained to use technology resources, particularly computer-based technologies." By 2000, things weren't much better; a National Center for Educational Statistics (NCES) report confirmed that only 33% of surveyed teachers felt they were "well" or "very well" prepared to use technology with their students.

Unfortunately, concerns about the dearth of PD for helping teachers integrate technology into their instructional practices raised nearly 25 years ago appear to still hold true despite repeated calls for increased attention to PD for technology integration. A 2009 NCES report indicated that two-thirds of U.S. public school teachers in the sample had received less than eight hours of inservice training for using technology with their students, and 78% reported that a "moderate" or "major" extent of their training had been through "independent learning."

Regardless of where the conversation takes place—in a classroom, conference hall, or coffee shop—when the word *technology* enters the dialogue, there is typically an immediate shift to thinking about the physical manifestations of technology. We eagerly show off our newest gadget, we extol the virtues of a new web 2.0 tool, or we lament when our "stuff" is not working. Implicit in these conversations is the cultural value that the technology of things takes precedence over the ways that technology can shift how we learn and teach. We, especially in education, look at technology largely to help us do the work we've always done in faster, more efficient, snappier ways. Yet it's this mindset of using technology to perpetuate the status quo that the newest efforts for PD in technology are working to deconstruct and shift.

For models of PD in technology to become crucial to reform movements, teachers must first be seen as learners. In *Models of Information Technology Teacher Professional Development that Engage with Teachers' Hearts and Minds*, Glenice Watson draws on the work of Everett Rogers to identify five types of teacher personalities in relation to change: the innovator, the early adopter, the early majority, the late majority, and the laggards. She points out that working with so many different types of teachers requires individualization and ongoing support. Whether that support comes from a "home-grown expert" or by supporting teachers as they create their own technology projects, Watson knows

that the pace of change in technology is swift and consistent. Without ongoing support for all kinds of teacher-learners, "only the innovators and the early adopters are able to keep pace with the changes."

In school environments where this frantic change can seem overwhelming and leave teachers feeling helpless, successful IT programs maintain a direct focus on the habits of mind and dispositions that drive paradigm shifts and cultural changes. Judi Harris, Punya Mishra, and Matthew Koehler recognize the less linear, more recursive nature of such dispositions in the TPACK framework and knowledge components discussed in *Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types: Curriculum-Based Technology Integration Reframed*. They believe teachers must have technological knowledge, pedagogical knowledge, and content knowledge, all synchronized in ways that support the teacher as a multifaceted learner. Thus, their PD models work to help teachers embrace "flexibility and fluency" as they implement new structures. When PD models focus on habits of mind versus "the machines," it can entice learners to contend with the value system that seeks to simply automate or redress the activities that have been part of the classroom culture. Perhaps a focus on dispositions instead of learning the newest features of PowerPoint might inspire teachers to consider how PowerPoint influences a model of deductive thinking, whereas a program like Prezi incites an inductive model of thinking. As Harris, Mishra, and Koehler reiterate, PD cannot be technocentric, but must also embrace pedagogy and content in a recursive process.

Similarly, D. Michele Jacobsen notes how crucial it is that students and teachers alike shift from the idea that technology is about "hardware, software, and network connections" to a mindset in which technology is "thinking tools for teaching and learning." In *Building Different Bridges: Technology Integration, Engaged Student Learning, and New Approaches to Professional Development*, she describes a highly successful program, the Galileo Network, that implicitly addresses the importance of having a tight focus but also points out how essential it is to extend that focus to the entire culture of the school. In the schools Jacobsen followed, the Galileo Network support team used relationships to bring a "social and political culture of reform" to their school systems. Working with school district personnel, school administrators, teachers, students, and parents, the network successfully built a culture where thinking and learning drove the reform. This focus on addressing the entire school culture to promote educational reform is consistent with the professional learning community forms of professional development.

Yet knowing how to navigate such an intense cultural shift in school contexts is especially tenuous. In *Addressing First- and Second-Order Barriers to Change; Strategies for Technology Integration*, Peggy Ertmer addresses the differences between first- and second-order barriers to change and delves into how these barriers apply specifically to technology integration. As she notes, first-order barriers impede integration because the "stuff" (hardware, software, bandwidth) aren't available. She then describes the second-order barriers as cultural, pedagogical, or value-based: "They are intrinsic to teachers and include … established classroom practices and unwillingness to change." As such, Ertmer offers ways to contend with such barriers when planning professional development: creating a vision, modeling, reflection, collaboration, and ongoing opportunities to shape the curriculum. Yet, perhaps most important, she reminds us that barriers often work in tandem and—consistent with the ideas of Harris, Mishra, and Koehler—addressing them requires a "simultaneous or at least recursive" approach to fully support reform in learning and teaching.

Just as students need to have meaningful and authentic work that drives them to inquiry, creativity, and intellectual risk, so must teachers have those same kinds of learning environments. If we are asking teachers only to digitize their existing classroom practices, we weaken the potential for technology to reframe how and why we teach. Perhaps the discussion isn't about professional development at all, but rather a discussion of professional learning opportunities.

Resources

Galileo Educational Network Association: www.galileo.org

Power On: New tools for teaching and learning: http://govinfo.library.unt.edu/ota/Ota_3/DATA/1988/8831.PDF

Prezi: http://prezi.com

Professional learning communities: www.allthingsplc.info

Teachers and Technology: Making the Connection: www.princeton.edu/~ota/disk1/1995/9541/9541.PDF

Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology: http://nces.ed.gov/surveys/frss/publications/2000102/

Teachers' Use of Educational Technology in U.S. Public Schools: http://nces.ed.gov/pubs2010/2010040.pdf

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